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TISKILWA BRIDGE
Carrying Township Road 236
over Bureau Creek
Tiskilwa Vicinity
Bureau County
Illinois

HAER No. IL-108

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historical American Engineering Record
National Park Service
Rocky National Mountain Regional Office
Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

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HISTORIC AMERICAN ENGINEERING RECORD

TISKILWA BRIDGE

HAER No. IL-108

I. INTRODUCTION

Present Location: Arispie Township Road 236
Spanning Bureau Creek
Near Tiskilwa, Bureau County, Illinois;
0.8 mi east of town center.

USGS Quadrangle: Princeton South
Latitude 41° - 17.6'; Longitude 89° - 29.6'
UTM 16.685000.1685900.

Inventory Data: Arispie Township Road District
Section 83-01117-00-BR
Station 18+00
Structure No. 006-4000
SE 1/4 of SE 1/4 of Sec 7, T25N, R11E
Bureau County.

Date of Construction: 1884, name plate, center span through truss
Unknown date, north span pony truss.

Owner, Custodian: Arispie Township.

Present Use: Vehicular bridge to be replaced.
Projected date of removal is 1994.

Significance: This three span bridge, located at a historic crossing on Bureau Creek, includes two Pratt truss spans. The 119' span is an early example of a Through Pratt built by the Smith Bridge Company, one of two spans in Illinois known to have been built by this prominent and prolific Toledo, Ohio, builder. The 60' pony span was built by the Decatur Bridge Company of Decatur, Illinois, a smaller bridge building company with bridges believed to have been generally limited to Illinois. Pin-connected Pratts were a common late 19th and early 20th century metal truss design which is

II. HISTORY

Centuries before the arrival of Euro-American settlers in the wilderness, animals located the first paths and natural stream fords by innate instinct. Buffalo herds would mill at a selected location near the stream bank, the mass circling and shoving toward the edge until those on the outside were pushed into the water. The first swimmers to the far shore encouraged the remainder of the herd to follow. In future years buffalo trails would become paths for Indians and frontiersmen. At this favored ford, near where Tiskilwa would be laid out in 1836, an important trail from the Peoria area to the south, forked after crossing the Bureau Creek, the principal path continuing northerly up the bluffs to Princeton, six miles distant, and beyond to meet the Sac and Fox trail which led to the British settlement in Detroit.

In 1825 Oliver W. Kellogg, following Indian trails, marked the first road from Peoria to the Galena lead mines in the northwest corner of the state. Six years later, when Dad Joe Smith, a legend in his time, was appointed overseer of the road his only help was four settlers along the 65 mile length. In 1833, when an act passed the Assembly to survey and permanently mark the road between Peoria and Galena, the road was already heavily used by settlers, soldiers, drovers, freighters and a daily mail coach. Dad Joe established the permanent route between Tiskilwa and Princeton where the Red Covered Bridge, built in 1863 north of Princeton, carries the Old Dad Joe Trail to this day.¹

Several years after Tiskilwa was settled, Steven's flour mill was built northeast of the settlement. An 1867 map of Arispie Township shows Steven's Mill and the early road to Princeton, the county seat, crossing Bureau Creek at the location of the present bridge.²

The main through truss of the bridge bears a Smith Bridge Company plate dated 1884. When the bridge was built, it is likely that existing bridges were located at Bureau Junction, six miles to the east and perhaps an equal distance upstream.

A 1902 map of Illinois bicycle routes shows Tiskilwa located on the only route between the market towns of Princeton to the north and Toulon to the southwest.³ A map prepared by the Illinois State Highway Department in 1917, before the establishment of route numbers, shows the Indian Head Trail connecting Chillicothe, near Peoria, and Galena, crossing Bureau Creek on the Tiskilwa Bridge. The Illinois Highway Magazine announced that civic groups were organizing to promote an extension to Minneapolis.⁴

The Tiskilwa bridge was built to carry Peoria-Princeton, north-south, traffic by the most direct route, avoiding overflow land along the

were extended through the valley in 1853 and the Illinois and Mississippi Canal, now Hennepin Canal, was constructed up the valley between 1890 and 1907. Since both railroad and canal terminal facilities were located at Bureau Junction, only six miles distant, Tiskilwa gained little benefit from these improvements. Today's traffic is routed away from Dad Joe's old road, the nearby canal is abandoned and the onetime transcontinental railroad is a secondary carrier.

No letting, construction or reconstruction information of the present bridge trusses have been located in county or township records. The substructure caissons, earlier known as tubes, at piers and abutments appear to be of 1884 vintage. Concrete caps of the caissons, however, appear to be later replacements, perhaps added around the 1930s.

The 60' Pratt pony truss span, the northernmost of three spans, carries a name plate of the Decatur Bridge Company, a company which could not have begun operations before 1903.⁵

Lower chords of the 1884 Through Pratt span have often been damaged by floating debris during flooding.⁶ It is reasonable to assume that the present pony truss, built by the Decatur Bridge Company, replaced an earlier pony span destroyed by flood.

III. THE BRIDGE

A. The Bridge Type

The Tiskilwa Bridge incorporates two Pratt truss spans, the center through span and the north pony span. Each span features inclined end posts and diagonal bracing.

The Pratt truss design was patented in 1844 by Caleb Pratt and his son Thomas to meet the need of heavier bridges for railroad use. Original Pratt trusses were developed for wood and iron rods but were soon adapted to wrought iron and later, after the 1890s, to steel as that material became more readily available. Utilizing inclined end posts and vertical columns in compression, eyebars for lower chord and principal diagonal tension members, and counter rods, often with turnbuckles or sleeves to tighten the system, Pratts were one of the most widely used metal trusses into the early twentieth century.

In the latter decades of the 19th century most bridge design and fabrication projects were carried out by small independent bridge companies. Several hundred bridge companies appeared, flourished for a time, then merged or disappeared. Many developed and patented designs which allowed them to build unique, if not better, bridges.

products were promoted by drummers and illustrated catalogs to often inexperienced county road commissioners.⁷

Pin-connected Pratts, an American phenomenon, were readily adaptable to shop fabrication, dismantlement for shipment and simple reassembly at the site. Construction was frequently by inexperienced crews working under a superintendent furnished by the manufacturer. Iron trusses with pinned connections were universally accepted in the United States, but rarely used elsewhere.⁸

Over the south portal of the through-span truss is a cast iron nameplate:

SMITH BRIDGE COMPANY
1884
TOLEDO, O.

Decorative cast finials, peaked globes, are mounted on three of the top corners of the through truss.

On the pony truss is a small medallion attached to the northeast hip post:

BUILT BY THE
DECATUR BRIDGE CO.
DECATUR, ILL.

Fabrication and assembly details of these structures are typical of the period.

B. The Manufacturers

1. The Smith Bridge Company

In 1867 Robert W. Smith opened his first company in Tiptecanoe City (later Tipp City), Ohio, to build his patented wooden bridges. He moved to Toledo in 1869 and in 1870 founded the Smith Bridge Company. The new company built hundreds of dependable wooden trusses, as well as composite trusses, wrought iron trusses, and later numerous steel bridges.⁹ J. F. Zwilling, who began his career as foreman of the Smith Company blacksmith shop when combination wood and iron bridges were constructed, became superintendent of the plant when the firm began making iron bridges. Smith sold the company in 1890 and the new owner changed the name to Toledo Bridge Company. In 1901 it was incorporated into the American Bridge Company at which time the company had 650 employees and an annual production of \$2,500,000.¹⁰

One other structure on the Illinois Historic Bridge Survey

2. The Decatur Bridge Company

The bridge company in Decatur, Illinois, was founded in 1902 by several employees of the Indiana Bridge Company of Muncie, Indiana. While looking for location sites in Illinois, the group changed trains in Decatur and were persuaded by the newly organized Chamber of Commerce to settle in Decatur. The company operated as Decatur Bridge Company until 1922, when it was absorbed by the Mississippi Valley Structural Steel Company. Mississippi Valley was subsequently bought by Bristol Iron and Steel Company and closed in the late 1970s.¹²

Three other structures on the Illinois Inventory are known to have been fabricated by the Decatur Bridge Company. The Airtight Bridge (015-3165), a 139' through Pratt truss built in 1914 near Charleston; a three-span pony lattice variation, with stiff legs, (020-6002), 60' total length, located in Woodland Cemetery, Clinton, date built unknown; and a pony Pratt (036-4212) built in 1915 near Biggsville.¹³

C. Structure Description

For drawings showing truss member nomenclature and typical Pratt truss details, see Appendix, pages 13 and 14.

Three spans, total length 194'-0"

1. South span, approximately 15' long, ten timber stringers in poor condition, no historical significance.
2. Center span, through Pratt truss; believed to be steel but may be wrought iron. Length 119'-0", eight (8) panels approximately 15'-0". Distance center to center of trusses 15'-6". Clear width between railings 14'-0". Center to center height between upper and lower chord approximately 16'-9". Clear height above the roadway at portal 13'-8".

Truss members, details are symmetrical about U4-L4:

Upper chords and inclined end posts:

Two 7"x2" channels with 12"x1/4" continuous top plate and bottom batten plates.

Lower chords:

L0-L1 two rods 1-3/8" dia., loop ends
L1-L2 two eyebars 3" x 1/2"
L2-L3 two eyebars 3" x 7/8"

Vertical Posts:

- U1-L1 two bars 1-1/8" x 1-1/8" loop ends
- U2-L2 two 6"x1-3/4" channels, 1-1/2"x1/4" single lacing each side, 7" alternate centers
- U3-L3 two 4"x1-1/4" channels, same lacing and spacing
- U4-L4 do.

Diagonals and counters:

- U1-L2 two eyebars 3"x5/8"
- U2-L3 two eyebars 2"x5/8"
- U3-L4 do.
- U3-L2 one counter rod, 3/4" dia., 1" dia. upset threads, 10-1/2" sleeve nut, loop ends
- U4-L3 do.

Floor Beams:

- Fabricated, haunched plate girders, 8" deep at ends, approximately 2'-0" deep center
- U-hangers, L1-L7, 1-3/8"x1-3/8", 1-1/2" dia. upset threads

Bottom lateral cross-bracing, 3/4" dia., loop ends, bent ends bolted to floor beam web

Stringers (joists):

- Seven 12"x3" timber, recent, good condition

Pins:

- Panel connections: 3" dia.
- End bearings: cast shoes, do.

Rivets: 3/4" dia. main members

Top lateral strut bracing: 4" I-beam, with continuous plate added to bottom; attached to upper chord centerline at panel points, without knee bracing. Top lateral cross bracing (with sleeve nuts) in each panel, approximately 3/4" dia. rods.

Portals: Light transverse lattice assembly 2'-6" high, attached to end posts with integral lattice knee bracing 2'-6"x2'-6". Sloped knee framing extends to top of portal. Top of frame is below U1 pin plates.

The use of light bracing, lack of a sway frame and knee bracing at the upper chord level, indicates an early truss with no provision made for transverse wind loading.

3. North Span, Pratt pony truss; steel

Length 60'-0", four panels at 15'-0". Clear width between railings 14'-0". Distance center to center of trusses 15'-6". Center to center height between upper and lower chords 8'-0".

Truss Members: Details are symmetrical about U2-L2.

Upper chords and inclined end posts:

Two 6"x2" channels with 12"x1/4" continuous top plate and bottom batten plates.

All Lower chords:

Two eyebars 2"x3/4"

All Vertical Posts:

Four angles 1-3/4"x1-3/4"x3/16", single lacing
1-1/4"x1/4", 7" alternate centers

Note: Vertical post pin plates are placed outside of upper chord channels.

Diagonals:

U1-L2 two eyebars 1-1/2"x1/2"

L1-U2 one counter rod 3/4" dia., turnbuckle, loop ends

Floor Beams:

I-beams, 12"x6"; U-hangers

Stringers: No information.

Pins at Panel connections: 2-1/2" dia.

Rivets: 3/4" dia., main members

The bridge deck in all spans consists of 3" transverse timber planking with steel tread plate runners.

Design loading for these two trusses is not known. Fabrication details indicate state-of-the-art assembly. All members are believed to be carbon steel with a probable unit design stress of 12,500 psi.

4. Substructure:

The two piers and north abutment consist of two concrete filled sheet metal caissons, 36" diameter, with deteriorated original 2-channel horizontal struts and rod cross-bracing.

Formed concrete caps on piers and north abutment appear to be of later construction, perhaps 1930s.

The north abutment incorporates a sheet plate backwall and wings at about 75°, reinforced on exposed faces with steel piles on approximately 4' centers. Wings are capped with concrete.

The original south abutment, heavy cut stone masonry, is cracked and abandoned. The remaining upstream end is parallel to the bank and stepped. South approach timber stringers span over the original abutment to a more recent concrete cap, apparently supported on piling.

D. Present Condition And Modification:

Bridge paint is deteriorating but members and connections are in fair condition. Although a six-ton posting has been recommended, the bridge is posted for three tons. This is probably due to the lightness of the original components, not to deterioration. There is no evidence of modification to the trusses. No significant distress was noted in the substructure.

E. Ownership and Future

The Tiskilwa Bridge is owned and maintained by Arispie Township. Due to the narrow roadway and low load carrying capacity, Bureau County is currently planning to replace this structure. Although the bridge, because of age and location, is of more than usual structural and historical interest, its alignment and size make preservation for recreational or historic purposes an unlikely alternative.

IV. ENDNOTES

¹Milo M. Quaife, Chicago's Highways, Old and New. (Chicago: D. F. Keller and Co., 1923), 94ff.; H. C. Bradsby, ed., History of Bureau County, Illinois. (Chicago: World Publishing Co., 1885), 404ff.

²Bradsby, op. cit., 112ff; N. Matson, Map of Bureau County, Illinois, with Sketches of Its Early Settlement. (Chicago: Tribune Co., 1867).

³Mendenhall's New Road Map of Illinois. (Cincinnati, Ohio: C. S. Mendenhall, 1902).

⁴Map Showing Marked Through Routes in Illinois. (Illinois State Highway Department, 1 February 1917); "Indian Head Trail Formed", Illinois Highways (State Highway Department, Illinois, May-June 1917), 63.

⁵Correspondence with Jerald A. Merrick, Decatur Public Library Reference Department, and enclosure, 13 July 1988.

⁶Conversation with David S. Sullivan, Bureau County Engineer, March 1993.

⁷David Plowden, Bridges: The Spans of North America. (New York: Viking Press, 1974), 67.

⁸_____, 62.

⁹Victor C. Darnell, Directory of American Bridge Building Companies, 1840-1890. (Washington, D.C.: Society for Industrial Archaeology, 1984), 55, 56.

¹⁰Toledo Critic, (Toledo) 8 February 1902; Toledo Blade (Toledo), 7 February 1936.

¹¹Illinois Department of Transportation, Historic Bridge Survey. (Springfield, Illinois: Bureau of Design and Environment, 1992), 3101m.1TP.

¹²O. T. Banton, ed., History of Macon County (Macon County Historical Society, 1976), 232.

¹³Bridge Survey, op. cit., 3101m.MP4.

¹⁴Milo S. Ketchum, C.E., Structural Engineer's Handbook, (New

V. SOURCES OF INFORMATION

A. Books

Banton, O.T. ed. History of Macon County. Macon County Historical Society, 1976. (Recent county history).

Bradsby, H. C., ed. History of Bureau County, Illinois. Chicago: World Publishing Company, 1885. (Early county history).

Darnell, Victor C. Directory of American Bridge Building Companies, 1840 - 1900. Washington, D.C.: Society for Industrial Archaeology, 1984. (An authoritative source book published by a branch of the Smithsonian Institution).

Matson, N. Map of Bureau County, Illinois, With Sketches of its Early Settlement. Chicago: Tribune Co., 1867.

Plowden, David. Bridges: The Spans of North America. New York: Viking Press, 1974. (An overview and illustrated history of the advancement and romance of bridge building).

Quaife, Milo M. Chicago's Highways, Old and New. Chicago: D. F. Keller and Co., 1923. (History of early roads in northern Illinois).

B. Magazines

"Indian Head Trail Formed", Illinois Highway Magazine, May-June 1917, 63.

Toledo Critic. Toledo, Ohio: 8 February 1902.

C. Newspapers

Toledo Blade. Toledo, Ohio: 7 February 1936.

D. Reports

Historic Bridge Survey. Springfield: Illinois Department of Transportation, Bureau of Design and Environment, 1992.

E. Maps

Mendenhall's New Road Map of Illinois...Showing Through Bicycle Routes. Cincinnati, Ohio: C. S. Mendenhall, 1902.

Map showing Marked Through Routes in Illinois. Illinois State Highway Department, 1 February 1917.

F. Correspondence

Merrick, Jerald A., Decatur Public Library Reference Department.
Letter of July 13, 1988, with page from 1920 Decatur City Directory.

G. Conversations

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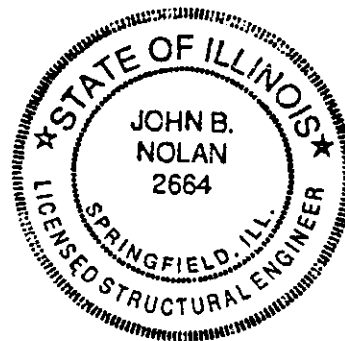
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VI PROJECT STATEMENT

This Historic American Engineering Record (HAER) report for the Tiskilwa Bridge is part of a long term program to document historically significant structures scheduled for replacement. Historically, early bridges are representative of state-of-the-art construction of earlier periods and provide a record of community needs and technology development at a point in times past.

Preparation of this report was directed by the Bureau of Design and Environment of the Illinois Department of Transportation. Field measurements, member descriptions, technical and historical research and writing were by John B. Nolan, licensed Structural Engineer in Illinois. Maxine P. Nolan assisted with the editing and word processing. Archival photography was by Roger McCredie, Staff Photographer, I.D.O.T. Office of Public Affairs. Jerome Jacobson, Historical Resources Specialist, Bureau of Design and Environment, was Project Supervisor.

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